TABLE 126
Impact of producing artificial intelligence or goods or services with artificial intelligence on worker types, by industry: 2016–18
(Number and percent)

	NAICS code	Companies (number)		Production	on worke	s		N	Nonproductio	n workers			Supervisory	workers		Nonsupervisory workers				
Industry			Increased	Decrease	Did r ed chan		Did not employ	Increased	Decreased	Did not change	Did not employ	Increased	Decreased	Did not change	Did not employ	Increased	Decreased	Did not change		
All industries	11, 21- 23, 31- 33, 42-81	19,775	16.0	2.7	50.9		30.4	13.3	3.0	62.4	21.3	12.0	2.0	65.1	20.9	14.2	2.9	61.6	21.3	
Manufacturing industries	31-33	817	25.7	5.9	r 62.	5	5.9	15.8	1.2	74.0	8.9	9.1	1.5	83.8	5.6	20.4 r	2.1	69.4	8.1	
Food	311	30 r	0.0	0.0			D	0.0	0.0	D	D	0.0	0.0	D	D	0.0	0.0	D	D	
Beverage and tobacco products	312	0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Textile, apparel, and leather products	313- 16	11	D	0.0	0.0		D	0.0	0.0	D	D	D	0.0	0.0	D	0.0	0.0	D	D	
Wood products	321	3	0.0	0.0		)	D	0.0	0.0	D	D	0.0	0.0	D	D	0.0	0.0	D	D	
Paper	322	D	0.0	0.0	0.0	)	D	0.0	0.0	0.0	D	0.0	0.0	D	0.0	D	0.0	0.0	0.0	
Printing and related support activities	323	56	D	17.9	r 78.6	5	0.0	8.9	0.0	67.9	D	8.9	0.0	91.1	0.0	12.5	D	75.0	0.0	
Petroleum and coal products	324	0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Chemicals	325	25 r	0.0	D	80.0	) r	0.0	D	0.0	96.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	100.0	0.0	
Pesticide, fertilizer, and other agricultural chemical manufacturing	3253	0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Pharmaceuticals and medicines	3254	D	0.0	0.0	Г		0.0	D	0.0	0.0	0.0	0.0	0.0	D	0.0	0.0	0.0	D	0.0	
Soap, cleaning compound, and toilet preparation manufacturing	3256	D	0.0	0.0	[	)	0.0	0.0	0.0	D	0.0	0.0	0.0	D	0.0	0.0	0.0	D	0.0	
Other chemicals	other 325	D	0.0	D	Г		0.0	0.0	0.0	D	0.0	0.0	0.0	D	0.0	0.0	0.0	D	0.0	
Plastics and rubber products	326	9	D	D	[		0.0	D	D	D	0.0	D	0.0	66.7	0.0	0.0	0.0	66.7	D	
Nonmetallic mineral products	327	D	D	0.0	0.0		D	D	0.0	0.0	D	D	D	0.0	0.0	D	D	0.0	0.0	
Primary metals	331	0	0.0	0.0	0.0	)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

TABLE 126

Impact of producing artificial intelligence or goods or services with artificial intelligence on worker types, by industry: 2016–18 (Number and percent)

		Companies (number)		Production	workers		1	lonproductio	n workers			Supervisory	workers		Nonsupervisory workers				
Industry	NAICS code			Decreased	Did not change	Did not employ	Increased	Decreased	Did not change	Did not employ	Increased	Decreased	Did not change		Increased	Decreased	Did not change		
Fabricated metal products	332	153	43.8	D	38.6	D	D	D	96.7	D	D	D	96.7	D	D	0.0	62.7	D	
Machinery	333	231	34.2 r	0.0	60.6	5.2 r	26.5 r	0.0	68.3	5.2 r	9.1 r	0.0	87.4	D	24.2 r	0.0	72.3	D	
Computer and electronic products	334	145	23.4	D	66.9	6.9 r	27.6 r	D	62.1	5.5 r	18.6 r	D	68.3	D	20.7 r	D	64.1	9.0 r	
Communications equipment	3342	9	D	0.0	88.9	0.0	D	0.0	88.9	0.0	0.0	0.0	100.0	0.0	0.0	0.0	100.0	0.0	
Semiconductor and other electronic components	3344	10	0.0	0.0	100.0	D	0.0	0.0	100.0 r	D	D	0.0	90.0 r	0.0	0.0	0.0	90.0	- D	
Navigational, measuring, electromedical, and control instruments	3345	93	34.4	. D	54.8	D	37.6 r	D	51.6 r	D	23.7 r	· D	55.9 r	D	28.0 r	D	51.6	D	
Other computer and electronic products	other 334	30	0.0	0.0	96.7	D	D	0.0	83.3	D	D	0.0	96.7	0.0	16.2	0.0	83.8	0.0	
Electrical equipment, appliances, and components	335	80	D	0.0	85.0	D	10.0 r	0.0	83.8	D	D	0.0	81.3	8.8 r	D	0.0	81.3	8.8 r	
Transportation equipment	336	17	D	D	76.5 r	D	D	0.0	82.4 r	D	D	0.0	70.6	D	D	0.0	76.5	D	
Automobiles, bodies, trailers, and parts	3361- 63	11	D	D	54.5 r	D	D	0.0	72.7 r	D	D	0.0	54.5	D	D	0.0	72.7	D	
Aerospace products and parts	3364	D	0.0	0.0	D	0.0	0.0	0.0	D	0.0	0.0	0.0	D	0.0	0.0	0.0	D	0.0	
Other transportation	other 336	D	0.0	0.0	D	0.0	0.0	0.0	D	0.0	0.0	0.0	D	0.0	D	0.0	D	0.0	
Furniture and related products	337	9 r	D	D	D	0.0	D	0.0	D	0.0	0.0	0.0	100.0 r	0.0	D	0.0	D	0.0	
Miscellaneous	339	46	15.2 r	0.0	71.7	D	D	0.0	52.2 r	D	D	D	87.0	D	D	D	52.2	D	
Medical equipment and supplies	3391	38	D	0.0	78.9	D	D	0.0	47.4 r	D	D	0.0	89.5	D	D	0.0	47.4	D	
Other miscellaneous manufacturing	3399	6 r	D	0.0	D	0.0	D	0.0	D	0.0	0.0	D	D	0.0	0.0	D	D	0.0	

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Impact of producing artificial intelligence or goods or services with artificial intelligence on worker types, by industry: 2016–18 (Number and percent)

		Companies (number)		Production	n workers		N	Nonproduct	tion workers	;		Supervisory	workers		N	Nonsupervisory workers				
Industry	NAICS code		Increased	Decreased	Did not change		Increased	Decrease	Did not change	Did not employ	Increased	Decreased	Did not change	Did not employ	Increased	Decreased	Did not change			
Nonmanufacturing industries	11, 21- 23, 42-81	18,959	15.6	2.6	50.4	31.4	13.1	3.0	62.0	21.9	12.2	2.0	64.2	21.6	13.9	3.0	61.2	21.9		
Agriculture, forestry, fishing, and hunting	11	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Mining, extraction, and support activities	21	D	0.0	0.0	D	0.0	0.0	0.0	D	0.0	0.0	0.0	D	0.0	0.0	0.0	D	0.0		
Utilities	22	5	D	0.0	D	0.0	D	0.0	D	0.0	D	0.0	D	0.0	D	0.0	D	0.0		
Construction	23	1,146	19.4	D	65.9	10.9 r	20.7	D	75.1	D	23.2	0.0	76.4	D	20.7	D	75.1	D		
Wholesale trade	42	1,322	5.9 r	D	55.1	35.6	8.2 r	D	76.5	13.8	12.1 r	1.7 r	71.2	15.0	9.0 r	D	73.4	17.2		
Retail trade	44-45	1,818	15.5	D	56.0	24.9	10.7 r	D	66.8	16.2	14.2	D	64.9	20.8	10.7 r	D	64.6	18.4		
Transportation and warehousing	48-49	92 r	D	D	47.8	41.3 r	10.9 r	0.0	84.8	D	33.7	0.0	57.6	D	31.5	0.0	59.8	D		
Information	51	1,301	19.5	1.6	42.6	36.2	23.1	2.1	r 57.8	17.1	19.8	1.8 r	63.2	15.1	23.2	1.8 r	59.6	15.4		
Publishing	511	428	20.8	D	47.0	31.1	19.5	2.1	r 58.7	19.7	16.8	D	62.9	17.3	21.3	D	59.3	16.4 r		
Newspaper, periodical, book, and directory publishers	5111	22	D	0.0	1 0.02	r D	0.0	D	68.2	D	0.0	D	54.5 r	22.7 r	0.0	D	54.5	22.7 r		
Software publishers	5112	407	20.9	D	46.9	31.2	20.4	D	57.7	19.9	17.7	D	63.4	16.7 r	22.4	D	59.7	16.0 r		
Telecommunications	517	170	10.0 r	D	39.4 r	r 47.1 r	6.5 r	D	77.1	5.9 r	11.2 r	D	71.8	8.8 r	5.9 r	D	75.9	8.8 r		
Data processing, hosting, and related services	518	521	15.9	1.7	r 45.3	37.2	25.9	D	54.9	19.0	18.8	0.0	65.3	15.9	24.6	0.0	59.1	16.3		
Other information	other 51	180	36.8	0.0	27.5	35.7	39.6	0.0	45.6	14.8	38.3	0.0	49.4	12.2	38.9	0.0	45.6	15.6		
Finance and insurance	52	780	28.8	0.0	39.1	32.2	19.2 r	0.0	48.1	32.7	17.8 r	0.0	51.0	31.2	24.1	D	40.1	31.3		
Real estate and rental and leasing	53	295	D	0.0	47.8 r	r D	D	0.0	67.1	D	D	0.0	100.0	0.0	D	0.0	62.0	D		
Lessors of nonfinancial intangible assets (except copyrighted works)	533	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		

TABLE 126
Impact of producing artificial intelligence or goods or services with artificial intelligence on worker types, by industry: 2016–18 (Number and percent)

		Companies (number)	Production workers						1	Nonprod	uctio	n workers	3		Supervisory workers						Nonsupervisory workers					
ndustry	NAICS code		Increased	d Decrea	sed	Did not change			eased	Decrea	ased	Did not change			creas	ed	Decreased	Did not change			crease	ed [	Decrea	sed	Did not change	
Other real estate and rental and leasing	other 53	295	D	0.0		47.8	r D		D	0.0		67.1	D		D		0.0	100.0	0.0		D		0.0		62.0	D
Professional, scientific, and technical services	54	8,045	12.8	0.9	r	50.9	35.4	9	.5	1.3	r	63.2	26.0		7.3		0.5	67.2	25.0		10.6		1.3	r	63.1	25.0
Legal services	5411	425	0.0	0.0		21.0	r 79.0	0	.0	D		38.8	47.5		D		0.0	37.2	49.2		0.0		D		30.1	r 56.2 r
Accounting, tax preparation, bookkeeping, and payroll services	5412	449	D	0.0		61.9	29.2	r 8	.7 r	· D		54.6	36.1		D		0.0	70.8	28.3		17.1	r	D		57.2	24.9 r
Architectural, engineering, and related services	5413	598	5.7	r D		63.7	30.4	11	.5	D		70.7	16.1	r	2.0	r	D	82.9	14.7		3.5		D		79.4	16.7 r
Specialized design services	5414	148	0.0	0.0		74.3	D	0	.0	0.0		49.3 r	D		0.0		0.0	49.3	r D		0.0		0.0		49.3	r D
Computer systems design and related services	5415	4,470	15.0	1.3	r	52.0	31.7	10	.6	0.5		65.9	23.0		6.4		0.6 r	71.8	21.2		10.8		0.7	r	68.0	20.5
Management, scientific, and technical consulting services	5416	1,184	15.5	r D		47.7	36.4	7	.6 r	D		68.2	23.8	1	10.8	r	D	56.8	32.0		11.4	r	D		56.8	31.3
Scientific research and development services	5417	274	23.0	r D		35.8	40.1	18	.2	D		47.1	33.6	2	24.1	r	D	56.6	17.5		33.2		D		49.6	16.4
Advertising, public relations, and related services	5418	182	4.9	D		44.5	49.5	6	ı 0.	D		71.4	20.9	r	6.0	r	D	61.0	31.9		6.0	r	D		73.1	19.8 r
Other professional, scientific, and technical services	5419	320	11.6	r 0.0		50.8	37.6	9	.4 ı	D		53.1	36.6		9.1	r	D	64.4	25.0	r	9.7	r	0.0		53.3	37.0
Management of companies and enterprises	55	D	D	0.0		0.0	0.0	0	.0	0.0		D	0.0		0.0		0.0	D	0.0		0.0		0.0		D	0.0
Administrative and support and waste management and remediation services	56	959	13.9	r 8.6	r	51.9	25.6	10	.4 r	. D		70.3	10.9	r	4.7	r	D	71.7	15.1	r	19.3	r	D		57.2	15.0 r

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Impact of producing artificial intelligence or goods or services with artificial intelligence on worker types, by industry: 2016–18 (Number and percent)

				Product	vorkers	1	Nonprodu	uctio	n worker	3			Supervisory	workers		Nonsupervisory workers					
Industry	NAICS code	Companies (number)	Increased	Decreas	sed	Did not change	Did not employ		Decrea	sed	Did not change	1 .		reased	Decreased	Did not change	Did not employ		Decreased	Did not change	1
Educational services	61	88 r	0.0	0.0		51.1 r	D	0.0	0.0		51.1	r D		0.0	0.0	51.1 r	D	0.0	0.0	51.1 r	D
Health care and social assistance	62	1,570	22.0	6.4	r	48.9	22.8	26.6	8.8	r	46.2	18.4	2	2.0	D	48.3	23.6	17.1	D	53.2	23.5
Health care services	621- 23	1,570	22.0	6.4	r	48.9	22.8	26.6	8.8	r	46.2	18.4	2	2.0	D	48.3	23.6	17.1	D	53.2	23.5
Social assistance	624	0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Arts, entertainment, and recreation	71	D	0.0	0.0		D	D	0.0	0.0		D	D		0.0	0.0	D	0.0	0.0	0.0	D	D
Accommodation and food services	72	749	34.8	D		29.4	28.3	27.9	D		30.4	35.0	2	7.9	D	28.4 r	28.3	27.9	D	36.2	28.3
Other services	81	637	0.0	0.0		54.9	45.1	D	0.0		62.0	37.5		D	0.0	54.9	44.7	D	0.0	62.0	37.5

D = withheld to avoid disclosing data for individual companies; data are included in higher-level totals. r = relative standard error > 50%.

NAICS = 2017 North American Industry Classification System.

## Note(s):

Detail may not add to total because of rounding or unavailable NAICS detail for select records beyond the 4-digit industry classification. Industry classification is based on dominant establishment payroll. Statistics are representative of companies located in the United States.

## Source(s):

National Center for Science and Engineering Statistics and Census Bureau, 2019 Annual Business Survey: Data Year 2018.